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Highlights

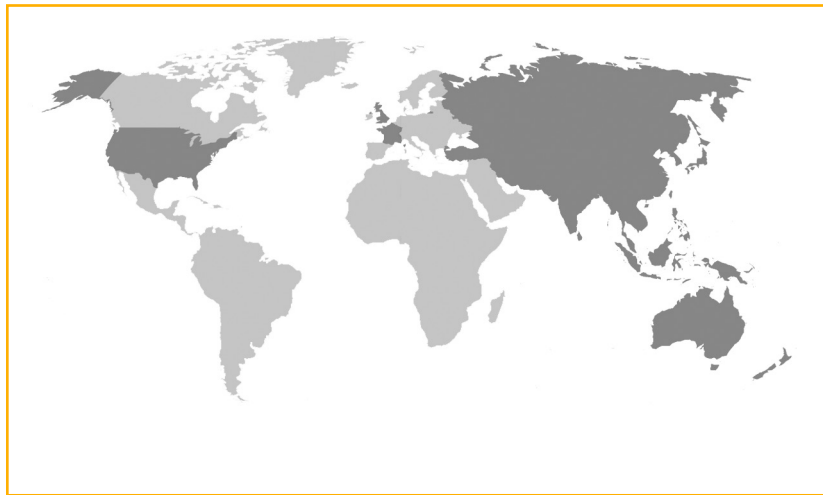
- Prediction system for food safety and quality
- Food additive that may prevent skin cancer
- Coating extends the shelf-life of eggs
- New way to make 'green' coffee
- Eco-friendly food packaging material
- Tomato-harvesting robots



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The Centre will achieve the above objectives by undertaking such functions as:

- Research and analysis of trends, conditions and opportunities;
- Advisory services;
- Dissemination of information and good practices;
- Networking and partnership with international organizations and key stakeholders; and
- Training of national personnel, particularly national scientists and policy analysts.



The shaded areas of the map indicate ESCAP members and associate members

Cover Photo

Multi-commodity solar dryer

(Credit: Philippine Center for Postharvest Development and Mechanization, Philippines)

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* Value Added Technology
Information Service

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ASEAN countries to improve nutrition policies

The member states of ASEAN have taken a major step forward in pledging to work across various government ministries to improve nutrition at national level and strengthen nutrition governance through inter-sectoral coordination. The multi-sectoral consultation, involving Ministries of Agriculture, Health, Rural Development, Planning and Social Welfare, are focusing on food security and nutrition to address all forms of malnutrition. The consultation, in collaboration with the World Health Organization (WHO) and the German Foundation GIZ, is the first of its kind in ASEAN.

It was convened to take forward the recommendations of the Rome Declaration on Nutrition from the Second International Conference on Nutrition (ICN2) in 2014 in order to lay a concrete foundation for promoting nutrition-sensitive agriculture and food-based approaches in ASEAN that would help achieve the Sustainable Development Goals (SDGs). Among the outcomes, the Rome Declaration on Nutrition stressed the need for government ministries to work together to achieve comprehensive improvements to nutrition at national level.

Source: <http://www.fao.org>

India issues food import norms notice

The Food Safety and Standards Authority of India (FSSAI) has issued a notice for operationalisation of Food Safety and Standards (Food Import) Regulations, 2016. As per the notice, these norms will be applicable with immediate effect

and no food article shall be allowed to be cleared from the Customs unless it has 60% shelf-life at the time of its clearance from the Customs.

According to the notice, the authority, may adopt a risk-based framework and inspection process for clearance of imported food articles. FSSAI, for this purpose, shall profile the importer, custom house agents, imported products, manufacturers of imported products, country of origin, source country of the consignment, port of entry, compliance history and any other parameters deemed fit for profiling the risk associated with the commodity. The authority may also introduce Pre Arrival Document Review (PADR) for regulating the imports.

According to sources, once the ministry develops a software-based procedure to use a risk-based criteria for clearance instead of sampling from each consignment, these norms could further be reviewed for speedy clearances. The ministry's notice earlier stated that the new system of clearance would commence from March 1, 2016, and only those consignments which come under predefined risk parameters will be subjected to sampling based on a software programme.

Source: <http://www.fnbnews.com>

Sri Lanka increases import tax on potatoes, onions

The Sri Lankan President, Maithripala Sirisena has instructed the Finance Ministry to increase the import tax for potatoes and big onions, with effect from March 1. The President gave the instructions at a special meeting at the Presidential Secretariat to discuss the issues faced by farmers island-wide. President Sirisena also imposed a

fixed price for 50 kg fertilizer packs for Rs. 2500.

The President further directed the officials to credit the fertilizer subsidy of Rs 25,000, which is given to farmers per hectare, to any bank account given by the farmers. Expressing his views the President said that the Government will not take any decision which will make the farming community uncomfortable. He further stated that the aim of the Government is to lighten the economic burdens on farmers.

Source: <http://www.freshplaza.com>

Study on palm oil in Indonesia

A joint-study between the Indonesian Sustainable Palm Oil Standard (ISPO) and the Roundtable on Sustainable Palm Oil (RSPO) has been officially released, marking a milestone for closer and effective cooperation between Indonesian and global palm oil sustainability standards. The study on "Similarities and Differences of the ISPO and the RSPO Certification Systems" is a joint initiative, endorsed by the Ministry of Agriculture. PT Mutu Agung Lestari, an independent certification body with competency to conduct both RSPO and ISPO audits, was appointed to perform the study.

Facilitated by The United Nations Development Programme (UNDP), the study represents a milestone in the formal collaboration between the two sustainability standards and has been touted as an important move toward streamlining the certification process within the Indonesian palm oil sector. The main findings of the study showed that both ISPO and RSPO aim to contribute to the reduction in loss of forest coverage, reduction of Green House Gas from

land use change and adherence to legal requirements.

However, the study also demonstrated that there are different elements contained in the requirements of the two standards. Key differences include the protected area and High Conservation Value concepts, oil palm plantation land ownership procedures based on Indonesian law and the concept of Free Prior Informed Consent (FPIC) process present in RSPO. The key recommendation by the study is to use the many common elements required by both certification systems as a basis to conduct a joint, more efficient ISPO audit and RSPO certification with an auditor who understands both systems.

Source: <http://www.foodingredientsfirst.com>

Sri Lanka to establish first pro food test lab

In a new turn for Sri Lanka's processed food sector, the first ever specialised Lankan scientific laboratory to test food products is to be unveiled this year. The new lab is expected to perform more than 500 food tests a month and more than 40% of Lankan MSMEs are involved in the food sector. "Sri Lanka's first laboratory for processed food testing is now being prepared by the Industrial Development Board (IDB). The new lab can perform many well-known processed food tests such as Microbiology, shelf-life and 'salmonella'," said Rishad Bathiudeen, Minister of Industry and Commerce.

Another initiative is the assistance scheme called Food Quality Certification Program. This was established to support food and packaging industry firms to receive such international certi-

fications as ISO 22000 HACCP and GMP. "With IDB we are also currently conducting a pilot project to upgrade Sri Lankan SME Food Processors to enhance their food manufacturing technology and international standards. The Ministry is also preparing loan facilities to the food processing sector. Loans are available upto Rs 7.5 million at 8% interest for machinery upgrade through the SMILE III project," added Bathiudeen.

Source: <http://www.news.lk>

Food safety capacity building

The United Nations Industrial Development Organization (UNIDO) and the Global Food Safety Initiative (GFSI) are expanding a long-term collaboration into a formal strategic partnership for large-scale capacity building programs. This partnership builds on the successful collaborations between GFSI and UNIDO since 2009, and follows the outstanding achievements made under the recent sustainable supplier development project (SSDP) successfully implemented in Malaysia.

Following the joint declaration made by UNIDO and GFSI, the roadmap that is currently being crafted is designed to implement food safety capacity building projects in a number of countries based on the GFSI Global Markets Program. The Program sets out how small and less developed food companies can meet the challenge of food safety, increase productivity and gain market access. This will be enabled by UNIDO.

The new strategy will harness the focus of GFSI members, the interests of UNIDO and the maturity of GFSI in targeted geographies. Once launched, the program will

focus on key regions in the global food network, beginning with China, Africa, Middle East and South-east Asia in a long-term roadmap approach.

Source: <http://www.foodingredientsfirst.com>

Viet Nam's supplemental food market

According to Tran Dang, chair of the Viet Nam Functional Food Association, export of the products can bring \$1 million a year, while the domestic market has been expanding by 9-10 percent per annum. Meanwhile, a market survey by Euromonitor showed that the Vietnamese supplement food market would continue growing up by 20 percent per annum in the upcoming years. In 2010, Viet Nam enterprises made up 66 percent of the domestic functional food market. But now, the market is being controlled by foreign companies, such as Amway and Tiens Viet Nam, Herbalife and Unicity Viet Nam.

Amway, just after five years of operation in Viet Nam, reported revenue of \$90 million in 2013. One year later, the company started construction of its second factory in Viet Nam. Herbalife, after setting foot in Viet Nam in 2009, has been expanding its network in Viet Nam with the growth rate of 50 percent per annum. The fact that Viet Nam ranks 16th in the group's global ranking in business index showed how Viet Nam is attractive in manufacturer's eyes. Nu Skin, which joined the Vietnamese market in 2013, has also reported a growth of 30-50 percent per annum.

Source: <http://www.english.vietnamnet.vn>

New requirements for health food naming in China

China Food and Drug Administration (CFDA) have announced new requirements for health food naming. Health foods with a name indicative of physiological functions will be prohibited from being manufactured from May 1, 2016. In consideration of the popularity of certain brands that may currently violate this rule, a grace period has been given to manufacturers which will allow them to phase in their new brand name by using dual brand names including the original product name and the new name.

Source: <https://www.food.chemlinked.com>

India issues advisory on packaging rules

The ministry of consumer affairs, government of India, has issued an advisory for deferring the implementation of the packaging rules amendment issued in May 2015. The department has stated that the affected industry can now use the old packaging till June 30, 2016. This has been done primarily to clear the old stocks and industry concerned thereby gets time to implement the amendments smoothly.

The new amendments state that the Food Safety and Standards Act 2006 rulings will prevail with respect to retail food packaging. The amendments to the Legal Metrology (Packaged Commodities) Rules 2015 were issued by the department of consumer affairs in May 2015, which came into force from January 1, 2016. The department informed that the advisory was issued after a series of representations of industry chambers citing

huge stockpile of old packaging and requested the department for time for clearance.

Meanwhile, industry representatives also termed this decision as positive as this would help in saving losses which were otherwise inevitable due to stockpile of old packaged goods. "Overall if we see this issue, it's a positive move by the regulatory. Big players like Nestle and Hindustan Unilever (HUL) usually plan in advance.

Source: <http://www.fnbnews.com>

New requirements for food labeling in Thailand

Thailand Food and Drug Administration has announced the requirements for food label nutritional symbols in accordance with the Food Act of B.E.2522 (1979). Food labels with nutritional symbols shall be verified and approved by the competent authority prior to sale in the Thai market. The nutritional standard or nutritional value used for further verification of labeled nutritional symbols shall conform to relevant technical requirements. The nutritional symbols labeled in accordance with this notification shall also comply with notifications on "labeling for prepackaged foods", "special foods" and "labeling for nutritional foods" released by Thailand Ministry of Public Health.

Source: <https://www.food.chemlinked.com>

New rules for safety management in Korea

The Republic of Korea has released new Special Law on Safety Management of Imported 11 Foods on Feb 4th, 2016. On the

same day, Korean Ministry of Food and Drug Safety (MFDS) issued its Implementation Rules which further supplements provisions of the special Law. The main contents include details about registration of overseas food manufacturers, measures on food import suspension and cancellation of suspension, recognition criteria for overseas food sanitation assessment agencies, food importers and distributor sanitation education, categories of food products that are subject to distribution and traceability management, etc.

According to the Implementation Rules, importers or overseas manufacturers should provide the manufacturer's name, address, legal representative, product types (such as food, food additive or health food, etc.) and business scope (like food or food additive and containers, packaging manufacturing) when applying for registration with MFDS. MFDS should inform the overseas manufacturer of any prohibition of importation in written form. When the ban is lifted, the manufacturer, importer or the exporting country should be informed of the change in writing.

Food importers and distributors should receive education regarding food laws/regulations, hygienic and quality management from MFDS every year. The required education time for new business entities is four hours and for existing entities is 3 hours. MFDS should categorize importers into excellent importers, general importers and those in need of special management. Each category will receive differential inspection and supervision during customs inspection, on-site inspection and sampling inspection.

Source: <https://www.food.chemlinked.com>

Way to potentially decrease peanut allergen

In a recent study, researchers from Ningbo Institute of Agricultural Sciences, China, found that seed germination could reduce the allergen level in peanuts. Allergenic proteins in peanuts are degraded during seed germination. The researchers found that by altering that natural process by controlling certain environmental factors, peanut allergenicity could be reduced.

The study specifically looked at temperature and light effects on Ara h1, a previously identified peanut allergen. The authors concluded that short-term germination could be an easy way to improve food safety of peanuts and produce hypoallergenic peanut food. Further studies are needed to assess the effects of germination on other major peanut allergens.

Source: <http://www.foodingredientsfirst.com>

Prediction system for food safety and quality

Small and medium-sized enterprises (SMEs) are under immense pressure to cut costs by optimising procedures and products while maintaining the quality and safety of food. An EU initiative has introduced software for food quality and hygiene management. The EU-funded SOPHY (Development of a software tool for prediction of ready-to-eat food product shelf-life, quality and safety) project sought to make this balancing act simpler by developing a web-based software tool that makes predictions about

the safety, quality and shelf-life of ready-to-eat (RTE) foods.

Fresh cut and delicatessen salads were the two RTE food commodity test cases chosen to develop the software. Online and market surveys, focus groups and on-site visits helped identify industry needs and expectations for the software ahead of development. SMEs can virtually optimise their raw material selection, product formulation and processing steps. The software estimates the effect of each production stage on the safety and shelf-life of a food product while taking quality into account. It can be easily extended to include further ingredients and be adapted to different RTE food products.

The SOPHY team gathered information about various processing methods, product formulations, environmental conditions, and hygiene, quality and safety management. These so-called information sheets enable SMEs with limited resources to understand the impact of various factors on shelf-life and pathogen growth determined by the models without having to carry out complex laboratory analyses. The SOPHY software solution saves salad-processing SMEs time and money while boosting their awareness of overall food safety and quality.

Source: <http://www.cordis.europa.eu>

Method for higher purity in wheat flour

Researchers at Kansas State University (KSU), the United States, have developed a new testing method to help millers assure wheat flour purity that will meet baking industry standards and consumers' expectations. The test introduces sophisticated molecular methods that focus on

high, endosperm purity in flour extracted from wheat kernels. "We are helping the miller by measuring the endosperm purity for flour streams coming from each stage of the milling process," said Mark Boatwright, at KSU.

This will allow the miller to optimize settings on equipment and make decisions to meet the baker's specifications for quality flour. When completed, the work being done at the university will allow the miller to exclude inferior flour streams from the final product. The researchers analyzed 29 flour streams from a commercial wheat mill to determine the endosperm purity as it moves closer to becoming flour for bread or other products.

Source: <http://www.phys.org>

Rapid detection of formaldehyde in food

The Hong Kong Polytechnic University (PolyU) has developed highly selective formaldehyde rapid detection method which involves only simple procedures. It can test 10 food samples on-site in one go in comparison to traditional methods which entail 30 minutes for the testing of each food sample one by one. Its cost is less than HK\$30, which is 90% lower than traditional testing methods. If the food sample contains formaldehyde, under hand-held UV light, the fluorescent probes will appear to be fluorescent blue, which can be easily observed by naked eyes.

Traditional methods for formaldehyde measurement are liquid chromatography which involves chemical derivation of formaldehyde, chromatographic separation and instrumental analysis of the formaldehyde content with reference to the sample standard. Based on

prior research on a chemical reaction that enables chemical coupling of 1) amine-functionalized resins, 2) formaldehyde and 3) fluorescent dyes via gold catalysis, PolyU researchers have developed fluorescent probes for rapid detection of formaldehyde in food with excellent selectivity and high stability.

Firstly, researchers added pre-treated food samples, amine-functionalized resins, fluorescent dyes and gold catalysts into a container, and heated the solution at 50 °C for 1 hour. After that, organic solvents were added to wash out excessive reagents. The three-component coupling reaction will connect resin-linked sterically bulky amines and fluorescent alkynes through chemical bonding with formaldehyde in food so that the surface of the resins can give out fluorescent blue colour under hand-held UV light.

Source: <http://www.phys.org>

New technique to detect harmful molecules

Scientists at the University of Leicester, the United Kingdom, have developed a new technique by which harmful bacterial molecules in certain processed foods such as burgers and ready meals can be identified. During the study, they identified a particular kind of contaminating molecule known as 'pathogen-associated molecular patterns' (PAMPs), which are released by certain types of bacteria as they grow during some food processing and refrigeration processes, and may increase risk of coronary artery disease and Type 2 diabetes.

"PAMPs are undetectable in non-processed and fresh foods, suggesting that they develop during

the manufacturing process. It has been understood for many years that frequent consumption of highly processed foods, particularly processed meats, is associated with increased risk of developing a range of diseases, including cardiovascular disease, Type 2 diabetes and obesity. Our recent findings have uncovered a potential mechanism by which certain types of processed food increase risk of developing these diseases", said Dr. Clett Erridge from the University of Leicester

The researchers believe that their new method of detecting PAMPs could be used by food manufacturers to help identify where in their production process the PAMP molecules are arising in foodstuffs, such as which parts of machinery or which raw materials introduce contamination to their products. The study suggests that when food is fresh, including any type of meat, fruit or vegetable, it contains undetectable levels of PAMPs. However, once it has been chopped finely, the PAMP content rises rapidly, even when stored at refrigeration temperature.

Source: <http://www.news-medical.net>

Chemical-free way to decontaminate food

Kevin Keener, at Purdue University, the United States, is cooperation with other researchers at Dublin Institute of Technology (DIT), Ireland, is working toward determining the effectiveness of electrically activating gases to produce atmospheric plasma within plastic packaging that houses those sliced and diced veggies and fruits. The next phase of testing will include liquids. This could ultimately lead to eliminating heat processes, or pasteurizing, that

also eliminate vital nutrients and enzymes with the microbes.

The current phase of testing is with atmospheric cold plasma. Prior testing had determined that applying an electrical field to liquids reduced microbial activity drastically. "Results from recent testing of *E. coli* bacteria in liquid suspensions demonstrated significant bacterial reductions with no heating or visual color change. This suggests that atmospheric cold plasma treatment may achieve a cold pasteurization process for liquid foods to extend shelf-life and improve safety," said Keener.

The way it works is electrical voltage is applied to a plastic bag containing the food items. The bag acts as an insulator to prevent the current from flowing through the food items, but the voltage at 50 to 100 watts activates the air inside to produce ozone, nitrogen oxides, hydrogen peroxide and other gases, all of which kill bacteria, stop fungal activity and prevent viral replication. The wattage is comparable to the energy needed to light the average filament light bulb. At under a minute of electrical voltage, the cost per item is low while the results are thus far better than older methods employed for sanitizing food.

Source: <http://www.naturalnews.com>

Capacity Building and Implementation of International Food Safety Standards in ASEAN Countries

The FAO regional project aims to strengthen capacities of ASEAN countries in contributing to Codex standards setting and implementing the adopted Codex standards.

For more information, access: <http://foodsafetyasiapacific.net>

Crab shells used in food products

Shinsuke Ikufu, a scientist at Tottori University, Japan, has developed a method to turn discarded crab shells into nanofibers, which can be used in food or beauty products. Ikufu said that after seeing thousands of tonnes of crab shells discarded every year, he decided to develop a method to recycle and take advantage of the raw material. Ikufu subsequently designed a machine capable of processing chitin, a carbohydrate that makes up 20 to 30 percent of crab shell.

The use of water and acid helped to extract the chitin from the shells, which was then refined through the machine. The results are fibers of around six nanometres in width. As the process is, in principle, more economical than existing ones producing chitin nanofibers, Ikufu plans to create a company with the support of his university to commercialise the product.

Source: <http://www.thestatesman.com>

Food additive that may prevent skin cancer

Researchers at the University of Arizona (UA), the United States, have discovered that a compound found in the natural food additive annatto prevents the formation of cancer cells and skin damage from UV radiation in mice. In the future the compound, bixin, may be valuable in the prevention and treatment of human skin cancers. Georg Wondrak, and Donna Zhang, both members of the UA, recently published a study in *Free Radical Biology and Medicine*.

Bixin is a bright reddish orange compound found in annatto, a natural condiment and food coloring derived from the seeds of the achiote fruit. Annatto, also known as achiote, has been a common ingredient in Latin American cooking since the pre-Columbian era. Dr. Wondrak's lab works to find small molecules, often in edible plants that can prevent skin cancer. Dr. Zhang is a leading expert on the Nrf2 transcription factor, which strengthens cells against exposure to carcinogens.

Dr. Wondrak says this discovery is unique because bixin is a nutritional factor, not a sunscreen applied to the skin. It prevents UV skin damage from the inside out by inducing cells to make protective antioxidants and repair factors. The compound does not kill skin cancer cells, but prevents their forming in the first place. Both the researchers find this compelling because it involves a commonly consumed food substance.

Source: <http://www.sciencenewsline.com>

More omega 3 acids in organic meat and milk

In a study an international team of experts led by Newcastle University, the United Kingdom, has shown that both organic milk and meat contain around 50% more beneficial omega-3 fatty acids than conventionally produced products. The study finds clear differences between organic and non-organic milk and meat. Analyzing data from around the world, the team reviewed 196 papers on milk and 67 papers on meat and found clear differences between organic and conventional milk and meat, especially in terms of fatty acid composition, and the concen-

trations of certain essential minerals and antioxidants.

The researchers said that the data shows a switch to organic meat and milk would go some way towards increasing our intake of nutritionally important fatty acids. A switch from conventional to organic meat and milk would raise omega-3 fat intake without increasing calories and undesirable saturated fat. For example, half a liter of organic full fat milk (or equivalent fat intakes from other dairy products like butter and cheese) provides an estimated 16% (39mg) of the recommended, daily intake of very long-chain omega-3, while conventional milk provides 11% (25mg).

Other positive changes in fat profiles included lower levels of myristic and palmitic acid in organic meat and a lower omega-3/omega-6 ratio in organic milk. Higher levels of fat soluble vitamins such as vitamin E and carotenoids and 40% more CLA in organic milk were also observed. The study also found 74% more iodine in conventional milk which is important information, especially for UK consumers, where iodized table salt is not widely available.

Source: <http://www.foodingredientsfirst.com>

Plant-derived sweetener Thaumatin

Researchers from Kyoto University, Japan, have found a way to make thaumatin, one of the sweetest natural sugar substitutes on the market, even sweeter. "Making natural sweeteners stronger could be a huge plus to the food industry, especially as there are concerns regarding the consumption of low-calorie sugar substitutes to prevent life style-related

diseases,” said Tetsuya Masuda, at Kyoto University.

Thaumatococcus, a protein derived from the fruit of an African tropical plant, is the sweetener of choice when it comes to “diet” beverages and gummy and jelly candies boasting natural ingredients. Thaumatin also masks bitterness and helps enhance flavor. Only humans and primates taste sweetness from thaumatococcus. Masuda and colleagues have analyzed its structure with X-rays to determine which parts of the protein make it taste sweet to us.

From these studies they found that the basic amino acids in thaumatococcus play a crucial role in eliciting “sweetness”, implying that substituting acidic amino acids with basic ones could make it sweeter. In this study, Masuda replaced aspartic acid with asparagine, making thaumatococcus 1.7 times sweeter than before. This also confirms the complex interaction between thaumatococcus and the sweetness receptor of the tongue, which was discovered in the early 2000s after long speculation by scientists.

Source: <http://www.foodingredientsfirst.com>

Tunable peptide emulsifiers

Scientists from the City University of New York’s Advanced Science Research Center (ASRC), the United States, and the University of Strathclyde, the United States, have discovered a new way to create emulsions with tunable properties, based on very simple biological molecules. Dr. Rein V. Ulijn of the ASRC and Strathclyde’s Dr. Tell Tuttle used a combination of experiments and simulations to show that dramatically variable

oil-in-water emulsions may be produced from tripeptides.

The research group showed the potential to form emulsions with tunable stability by mixing oil, water and designed peptides composed of specific sequences of just three amino acids – the building blocks of proteins which are the structural and functional units of all living systems. “We are using the same biological building materials that nature uses – but in much simpler ways – to form these short peptides. These emulsions are biodegradable to amino acids, which are safe for use in food and drugs,” said Ulijn.

“This project provides an excellent example of how fundamental science can be rapidly translated to real-world applications when the right team is in place. The Advanced Science Research Center brings together top researchers, provides them with a creative environment and the most advanced equipment to spark innovative approaches to complex scientific challenges,” said Dr. Gillian M. Small, at ASRC.

Source: <http://www.phys.org>

New, healthier sweetener

Scientists at Ghent University (UGent), Belgium, have developed an enzyme with which they can produce a new sweetener that is low on calories, stimulates the growth and activity of bacteria in the colon and doesn’t damage teeth. The healthier sweetener, called kojibiose, was discovered by accident. “When we were studying the characteristics of a certain enzyme, we suddenly noticed that it formed very small amounts of kojibiose,” said Tom Desmet, at UGent.

Together with Tom Verhaeghe, Desmet modified the enzyme in such a way that it can produce kojibiose more easily. “Until now, it was very difficult to produce kojibiose in amounts large enough to perform tests on. By manipulating the enzyme, this became possible,” Desmet explained. According to the scientists, kojibiose is an ideal substitute for classic sweeteners like sucrose and fructose.

It’s not only better for the teeth, it also works as a prebiotic – a food substance that improves intestinal flora. Prebiotics are becoming increasingly important in the prevention of diabetes, cancer and Crohn’s Disease. There are few prebiotics that taste sweet and could be used as a substitute for sugar. The researchers are now examining, together with the food sector, how to commercialise the discovery and bring the “sugar of the future” from the lab to the supermarkets.

Source: <http://www.flanderstoday.eu>

JECFA database

The database contains basic information (ADI, dietary exposure... etc) for all chemicals evaluated by the Joint Committee on Food Additives and Contaminants (JECFA) as well as the available publications (reports and monograph) for each compound. The database contains the summaries of all the evaluations of flavours, food additives, contaminants, toxicants and veterinary drugs JECFA has performed. Each summary contains basic chemical information, ADIs/TDIs, links to the most recent reports and monographs as well as to the specification database, and a history of JECFA evaluations. The database is searchable by partial name or CAS number, by first character (letter or symbol), or by functional class.

For more information, access:
<http://apps.who.int/food-additives-contaminants-jecfa-database/>

Technology extends the shelf-life of fresh produce

BotanoCap, an Israeli start-up has launched a new campaign on crowd funding platform Kickstarter, as it seeks finance its novel method of preserving fruit and vegetables for longer. A single patch of Phresh powder is designed to extend the shelf-life of various fruits – including apples, grapes, strawberries and tomatoes – as well as vegetables such as cucumbers, potatoes, aubergines, peppers and mushrooms. There are also plans to add other fruits and vegetables to the list of foods protected by Phresh.

Based on over 12 years of research from BotanoCap, Phresh's powder is composed out of essential oils – natural preservatives created by plants such as oregano, spearmint, mustard oil, and others. Using a patented micro-encapsulation procedure, each grain of the powder extends the effect of the preservatives to over a month. The powder dissolves into the atmosphere and creates a protective shield that extends the life of the produce. The consumer initially places one of the powder sachets into one of three perforated Food Protectors, shaped as either an apple or a robot.

Each package supplied by Phresh contains 12 sachets, which is enough for one year's use. Each Food Protector is equipped with an LED lamp that changes colour over time, reminding the user to change the powder once every one or two months. After that, the consumer places the Food Protectors near fruit or vegetables, in the fridge, fruit bowl or on the counter-top, and the powder begins to protect the produce from decay. The

Food Protectors product combines attractive design with high-end organic technology to increase the shelf-life of fruits and vegetables by three times and allow people to enjoy healthier foods for longer periods of time.

Source: <http://www.foodbev.com>

Coating extends the shelf-life of eggs

Researchers from Brazilian Agricultural Research Corporation (EMBRAPA) have created a nano coating which makes it possible to safely store eggs without refrigeration. The coating not only makes the eggs easier to transport but also extends their shelf-life, thus eliminating the need to refrigerate them. The concept of coating perishable foods is not new. Producers have long been coating apples and citrus with wax to protect them from bruising and make them more visually appealing to consumers. The trick is to find the right material for coating. Researchers have been experimenting with different kinds of nano-structured coatings.

The resulting choice is a biodegradable polymer frequently used in pharmaceuticals and the food industry. During testing, the coated eggs were in better condition after been stored one month at room temperature than their uncoated counterparts. This is a result of the coating's ability to limit the water loss of the egg and to reduce the amount of outside gasses entering through the porous shell, which compromise the egg's quality. The coated eggs also fared much better than their counterparts in the shell strength tests, experiencing less cracks and keeping the internal structure of the egg intact.

Source: <http://www.eatglobe.com>

Irradiated papaya has high shelf-life

Scientists from the Bhabha Atomic Research Centre (BARC), India, have developed notable processing methods to make papaya a high shelf-life super-food. They noted that papaya fruit is highly perishable resulting in around 25 per cent postharvest loss which is further enhanced during storage and transportation. They developed a novel combination technology including osmotic dehydration, blanching and infrared drying to make intermediate moisture (IM) papaya cubes to prevent these losses.

They further hygienised these cubes after packing them and exposing them to a gamma radiation dose of 2 kGy. (Gy, a unit of radiation dose, represents energy absorption of one joule per kg; kGy is 1000 Gy). In their study, they packed the intermediate moisture (IM) papaya cubes (20 pieces; approx. 50 g/packet) in low density polythene packets. Radiation processing helps to reduce the microbial load.

Scientists secured other benefits. They demonstrated that processed IM cubes showed nearly 5-fold increase in calorific value; the per unit dry weight content of carbohydrate, protein, fibre, and functional bioactives such as ascorbic acid, carotenoids, and phenolics including flavonoids were found to increase significantly. Researchers quantitatively demonstrated that the functional properties in terms of antioxidant capacity and antimutagenic potential were improved in the final product.

Source: <http://www.thehindu.com>

Atmosphere packaging gases extend shelf-life

Linde Canada Ltd has introduced its MAPAX® line of modified atmosphere packaging (MAP) gases that help extend shelf-life and maintain the quality of fresh food products. This product line will help to meet the increasing demand for packaged prepared foods in Canada. “We’re launching the Linde MAPAX product line, developed by Linde global food specialists, to provide Canadian food processors with superior products and services to meet the growing consumer trend toward fresh prepared foods,” said Drew Sansom, at Linde Canada.

The MAPAX solution inhibits the deterioration of food in a natural way by combining the correct pure gas or gas mixture of nitrogen, carbon dioxide and oxygen to keep products fresh and appetizing and help reduce returns due to spoilage. The MAPAX solution also improves distribution because foods protected by MAPAX gas mixtures can be delivered across longer distances or on a less frequent basis for enhanced logistical flexibility.

“The MAPAX modified atmosphere packaging solution is ideal for trayed, bagged and pouched products, and can often extend the practical shelf-life of fresh foods typically by 200% or more compared with packaging in air,” said Sansom. For example, the shelf-life of meat varieties can be extended to 2 to 3 times, and baked goods to 3 to 4 times. *Contact: Suzan Doucet, Communications Lead, Linde Canada Ltd., 5860 Chedworth Way, Mississauga, Ontario L5R 0A2,*

Canada. Tel: +1-905-501-3730; E-mail: suzan.doucet@linde.com.

Source: <http://www.news.thomasnet.com>

Extending fresh-cut vegetable storage

Fresh-cut peppers are handy for snacking and in reducing meal-preparation time for consumers. But sometimes that freshness is short-lived. However in a study, plant geneticist John Stommel and his research team with the Genetic Improvement of Fruits and Vegetables Laboratory, the United States, and food technologist Yaguang (Sunny) Luo with the Food Quality Laboratory, the United States, evaluated a diverse collection of peppers for attributes that prolong the shelf-life of fresh-cut pepper.

“Extensive genetic diversity is present in the Capsicum gene pool, which includes cultivated peppers. This diversity has been utilized to improve pepper disease resistance, fruit quality, and yield,” said Stommel. The fresh-cut fruit and vegetable industry has expanded rapidly during the past decade due to the convenience and nutrition that fresh-cut produce offers to consumers. To help producers respond to the increased demand, the team identified varieties that were resistant to deterioration over 14 days of cold storage.

The team looked at 50 pepper varieties obtained commercially and from the ARS collection –sweet bell, large elongated peppers, jalapeno, and serrano – to find those that can stand up to prolonged cold storage. Fresh-cut sweet bell and elongated peppers exhibited signs of deterioration, such as fluid leakage, after 10 to 14 days of storage, whereas jalapeno and

serrano peppers didn’t lose fluids until 14 days of storage.

Source: <http://www.phys.org>

Antibacterial polymer prolongs shelf-life

Parx Plastics, a Dutch startup company has created a material that can reduce the amount of harmful bacteria growing inside food packaging by 97 percent. Parx Plastics has come up with a solution to create an antibacterial tray for meats, poultry and fish, that does not contain any harmful elements. On the contrary, it uses the natural trace mineral Zinc, which is essential for the proper functioning of the human body.

The company’s invention – an antibacterial polymer, called Sanipolymers – securely incorporates Zinc within the material itself, which means that it cannot exit the material or wear out. Zinc prevents the cells of bacteria from multiplying, which eventually leads to cellular death. This is why the Sanypolymers packaging was found to have 93-97 percent less bacteria on its surface after 24 hours, compared to conventional packaging.

Source: <http://www.eatglobe.com>

WHO estimates of the global burden of foodborne diseases

The World Health Organization (WHO) has launched a comprehensive report estimating the global burden of foodborne diseases. The report includes estimates of the burden of foodborne diseases caused by 31 bacteria, viruses, parasites, toxins and chemicals.

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New way to make 'green' coffee

Scientists from Brandeis University, the United States, have developed a new method of roasting green coffee beans that could enhance the health benefits of the brew. Dan Perlman from Brandeis University is developing the flour milled from parbaked coffee beans both as a food ingredient and a nutritional supplement. "It is a world of difference from the traditional coffee bean," Perlman said. Perlman wondered what would happen if the coffee bean was baked for less time and at a lower temperature.

This took some trial and error until he got it right. In the end, he determined that parbaking the beans at 148°C at approximately ten minutes worked best. The concentration of CGA in the bean, around 10 per cent of the bean's weight, barely dropped. The parbaked coffee bean cannot be used to make coffee. It is not roasted long enough to develop flavour. Instead Perlman cryogenically mills the bean in an ultra-cold and chemically inert liquid nitrogen atmosphere to protect the bean's beneficial constituents from oxidation.

"At the end of the process, you get a wheat-coloured flour. Its taste is nutty, pleasant and mild," researchers said. Perlman sees his coffee flour being blended with regular flours for baking, used in breakfast cereals and snack bars and added to soups, juices and nutritional drinks. To compensate for the CGA lost during traditional coffee roasting, it would be possible to blend parbaked beans with regularly roasted ones.

Source: <http://www.deccanchronicle.com>

New coconut beverage

The Coconut Development Board (CDB), India, in association with Central Food Technological Research Institute (CFTRI), India, has developed a new product called Tender Coconut Beverage (Coconut Lassi). Tender Coconut Beverage is prepared by mixing tender coconut endosperm with tender coconut water along with permissible additives and sweeteners followed by thermal treatment.

The product has a shelf-life of six months at ambient temperature. This is a very refreshing drink retaining all the natural flavour and nutrients of tender coconut water. It is the most ideal drink to quench one's thirst during summer season, said CDB officials. *Contact: Technology Section, Coconut Development Board (CDB), India. Tel: +91-484-2376265.*

Source: <http://www.newindianexpress.com>

Agave drink with probiotics

Specialists from the Popular Autonomous University of Puebla (UPAEP), Mexico, with the help of a drink designed from agave and probiotic microorganisms, have succeeded in reducing sugar blood levels in students who were given a glucose solution. The beverage designed is non-dairy and does not contain alcohol, recommended in the diet of people with diabetes and lactose intolerance.

"We tested a sample group of 10 students who were administered a glucose solution and then 250 milliliters of the beverage, their blood glucose levels were measured after and the results showed that they dropped significantly," said Beatriz Perez Armendariz,

at UPAEP. The technology with which the beverage was designed consists of a pasteurizing heat treatment in which the microflora existing in mead is removed, thus preventing the liquid to ferment.

"Mead contains sugars, called fructans or non-soluble fibers with a hypoglycemic effect that controls sugar levels, the problem is that the product is fermented rapidly and can become pulque (a type of typical artisan spirit), hence the importance of creating a method that can keep the product fresh for a long period," said Beatriz Peres, who led the project.

Source: <http://www.alphagalileo.org>

Grape juice concentrate

Welch, the United States, has announced to sell its Concord grape juice concentrate on the European mainland for the first time, giving beverage companies the chance to harness its one-of-a-kind taste and natural plant nutrient content to produce innovative products consumers will love. Under an exclusive distribution agreement with Wild Juice, Netherlands, Concord grape juice concentrate will be available for companies across the EMEA region to use in branded and private label beverages.

The Concord grape is a plant nutrient powerhouse and its 100% juice has more polyphenols than many other commonly consumed juices. Concord grape juice has a greater concentration of polyphenols than several 'superfruit' juices. According to a study, Concord grape juice delivers 13% more polyphenols than blueberry juice, 24% more than acai juice and 53% more than cranberry juice.

Research suggests that certain polyphenols may play a role in supporting a healthy heart, and the polyphenols in Concord grape juice are no exception. In fact, Concord grape juice delivers many of the same polyphenols – and many of the same heart-health benefits – as red wine. Nearly 20 years of research shows that Concord grape juice helps support a healthy heart. Additionally, a new study suggests that one way in which Concord grapes and grape juice may support a healthy heart is by promoting healthy circulation.

Source: <http://www.foodingredientsfirst.com>

Technology to improve efficiency in milk production

Tetra Pak, Switzerland, has extended the application of its OneStep processing technology to milk production from powder; offering a solution that has only been available previously for production from raw milk. Producers can now prepare UHT milk from powder in one continuous step, reducing operational cost by up to 40 per cent, and cutting carbon impact by more than a half. Tetra Pak's OneStep technology removes the multiple steps of pasteurisation and intermediate storage in the traditional process of preparing milk from powder before UHT treatment.

In addition to simplifying and accelerating milk preparation, the OneStep technology enables complete automation and continuous operations, reducing milk waste traditionally lost between processing steps and improving consistency in product quality.

Tetra Pak OneStep technology can be used to produce one single product, or configured into multiple streams to produce a number of recipes, giving customers full flexibility in production. It can also be used to produce formulated milk, which combines liquid milk or powder with fat and flavour to create flavoured and value added milk or lactic acid drinks.

Source: <http://www.tetrapak.com>

Low-sugar cold-pressed drinks

Grounded, the United Kingdom, a new beverage start-up company has launched a range of low-sugar, all-natural cold-pressed drinks, designed to bridge the gap between plain water and sugar-loaded juices. Grounded fruit waters are available in cucumber and mint, lemon and ginger, and lime and lemongrass flavour combinations which contain an average of just 3.3g of sugar per 100ml and deliver 14 calories per 100ml serving.

Typical fruit juices and smoothies usually begin at around 9g and 35 calories respectively. The drinks are 100% natural made with raw ingredients, and free from preservatives, additives or flavourings. Cold-pressed and pasteurised with a 30-day shelf-life, the innovations "represent the next-generation of cold-pressed drinks", Grounded said.

Source: <http://www.foodbev.com>

Eucheuma-based healthy beverages

Food scientists at National University of Singapore (NUS) have developed the eucheuma-based

packaged beverages with no added sugar and preservatives with a local company, YGC Group. Eucheuma, a category of edible red seaweed mostly grows in Southeast Asia. Eucheuma is high in crude protein, dietary fibre, omega-3 fatty acid, vitamin C and minerals. It has properties of both seafood and vegetables. Regular consumption of eucheuma will help improve body functions, including promoting healthy digestion and preventing colon cancer and cardiovascular diseases. It can also lower blood pressure, cholesterol and glucose levels and promote brain development, anti-aging and help tissue repair.

A research team led by Prof YANG Hongshun from the Food Science and Technology Programme at the Department of Chemistry in NUS, has developed the eucheuma-based beverages with no added sugar, preservative-free. The sweetness comes from natural honey or fruit or herbal extracts. No preservatives are needed for this beverage. Furthermore, the team applied proper food grade hydrocolloids to evenly distribute the ingredients in the beverage system, which makes it appealing to consumers.

With the input from a team of food science and technology students, NUS researchers and YGC Group, more new products have been developed: osmanthus honey eucheuma drink and orange eucheuma drink. Prof Yang was awarded a 'certification of appreciation' from the company in 2015 for his contribution to the company's research and development.

Source: <http://www.science.nus.edu.sg>

Eco-friendly food packaging material

Researchers from the National University of Singapore (NUS) have successfully developed an environmentally-friendly food packaging material that is free from chemical additives, by fortifying natural chitosan-based composite film with grapefruit seed extract (GFSE). This novel food packaging material can slow down fungal growth, doubling the shelf-life of perishable food, such as bread. Laboratory experiments showed that the shelf-life of bread samples packaged with chitosan-based GFSE composite films was 2-times longer than synthetic packaging films.

Chitosan, a natural and biodegradable polymer derived from the shells of shrimp and other crustaceans, has immense potential for applications in food technology, owing to its biocompatibility, non-toxicity, short time biodegradability and excellent film forming ability. Chitosan also has inherent antimicrobial and antifungal properties. GFSE, on the other hand, is antioxidant and possesses strong antiseptic, germicidal, anti-bacterial, fungicidal and anti-viral properties.

Thian Eng San and Ms Tan Yi Min at NUS spent three years perfecting the formulation to create a novel composite film that not only prevents the growth of fungi and bacteria, but has mechanical strength and flexibility that are comparable to synthetic polyethylene film commonly used for food packaging. The composite film also effectively blocks ultraviolet light, hence slowing down the degradation of food products as a result of oxidation and photochemical deterioration reactions.

Source: <https://www.news.nus.edu.sg>

New bio-based mineral oil barrier technology

VTT, Finland, the leading technical research institute in the Nordic countries, has come up with a new bio-based mineral oil barrier for use in food packaging. The invention tackles an issue that first became manifest in 2011: the migration of mineral oils into foods packaged in paper and board. The main source of these mineral oils are thought to be the materials used for packaging, especially recycled paper and board, as these can contain ink from the newspapers that were recycled to make the cardboard boxes.

VTT has now addressed this migration problem by developing wholly bio-based mineral oil barrier bags. The 2-layer film can be used as a 'bag-in-box' liner for dry foods such as breakfast cereals. These liners have, up until now, mostly been manufactured from conventional HDPE film – and evidently are inadequate to prevent the migration of mineral oil components into the packaged food products. Polyethylene inner bags typically first adsorb hydrocarbons and later release them towards the food.

VTT's SutCo pilot foam coating line and new patent pending technology (PCT/FI2016/5075) based on the use of nanosized cellulose fibrils has been shown to decrease mineral oil migration to acceptable levels. Bio-based barrier bags prepared from Tempo-CNF coated bio-HDPE film protected the content to a great extent from mineral oil migration. There was no evidence of any leakages through heat-sealed areas of bags and completely transparent films behaved faultlessly during

processing. Very low migration of each mineral oil component was obtained with Tempo-CNF coatings.

Source: <http://www.bioplasticsmagazine.com>

Biodegradable fruit bag

The Department of Agriculture's Philippine Center for Postharvest Development and Mechanization (PhilMech) has conducted tests on a transparent biodegradable bag for use in farms to help reduce the amount of plastic waste which is harmful to the environment. PhilMech in collaboration with the National Mango Research and Development Center, Guimaras, has tested a biodegradable bag made from cassava starch and polybutylene succinate (PBS). The PBS and starch were melt-blended in a twin-screw extruder and then blown into a film extrusion machine.

PhilMech first developed a transparent biodegradable fruit bag for testing. The biodegradable fruit bag measures 6 x 8 inches with a thickness of 150 microns. The tensile strength is within the range of low-density polyethylene (LDPE) while the elongation is within the range of high-density polyethylene (HDPE). However, the biodegradable bag has higher density and absorbs more water.

PhilMech projects that the biodegradable fruit bag would completely degrade after 36 weeks.

When the biodegradable bag was tested as packaging on fruits, the quality of harvested fruits in terms of percent marketable, non-marketable and export, peel color at ripe stage, flesh color and percent edible portion were comparable

with the existing bagging materials such as a Chinese brown paper bag and old newspaper.

Source: <http://www.manilatimes.net>

Biodegradable packaging films

Researchers from Isfahan University, Islamic Republic of Iran, have produced biodegradable packaging films using nanomaterials. According to Iran Nanotechnology Initiative Council (INIC), Nanocomposite films can be used in the packaging of various products after mass production. In addition to having best mechanical properties, the films can be produced faster in a cheaper manner due to the possibility of continuous production in extruder in comparison with usual films used in industries.

Starch has a wide application in the production of biodegradable materials due to its availability, reasonable price and quick natural degradation. However, these materials have weak mechanical properties and low reactivity in comparison with materials produced on polymeric materials based on petroleum. Therefore, the aim of the research was to improve the mechanical properties of biodegradable packaging films by using clay nanoparticles.

In addition to having optimal mechanical properties, the films produced in this research are able to reduce the cost and increase the rate of production. Therefore, they increase the quality and efficiency in comparison with usual films, and they decrease environmental pollution due to the biodegradability of starch. These characteristics enable environmental friendly films to compete with polymeric ones. Results of the research have

been published in *Journal of Film and Sheeting*.

Source: <http://www.en.mehrnews.com>

Biodegradable alternative to plastic sachets

Three students of the chemical engineering department from IIT Madras, India, have developed a printable three thin-layered sachet made from cellophane, which is regenerated cellulose; starch; polyvinyl alcohol, a water-soluble synthetic polymer, and a natural vitamin-like molecule. This biodegradable solution to plastic, a major pollutant, won an award at a national competition organised by consumer goods company Hindustan Lever, India.

Praneeth, who worked with his team for four months on the material for sachets, said they had to look for something strong, flexible, air, light and water-resistant. After skimming through several research papers on biodegradable material and existing eco-friendly packaging products, they zeroed in on cellophane. Cellophane is regenerated cellulose that makes tree trunks strong and hold up the tallest trees. Cellophane was chosen as the innermost material because it had all the properties of polyethylene, a synthetic plastic presently used to make most sachets.

Source: <http://www.timesofindia.indiatimes.com>

Green plastics for food packaging

EU-funded researchers have adapted two biodegradable plastics made from crop waste for use as food packaging, laying the

groundwork for Europe to become a global leader in the sector. Promising candidates have emerged from the SUSFOFLEX project, which produced novel packaging using polylactic acid (PLA), and from SUCCIPACK, which adapted polybutylene succinate (PBS) for use by the food industry. PLA and PBS can be made from by-products left over from farming crops such as wheat, corn and beetroot. The two plastics are biodegradable – they can be broken down into their basic constituents, such as water, carbon dioxide and compost.

SUSFOFLEX resulted in prototypes of a PLA-based plastic, an innovative pack design, and two types of sensors to indicate whether the food inside is safe to eat. The project targeted pre-cut fruit products, an important market segment. The plastic could be adapted for other types of foods, such as cut vegetables, and meat, he adds. SUSFOFLEX developed techniques to combine PLA with cellulose extracted from wheat straw, an agricultural by-product, and with a natural antioxidant obtained from waste orange peels.

The SUCCIPACK project demonstrated a production process to produce PBS-based plastics suitable for food packaging. The innovations included a process to improve the resistance of PBS-based packaging to oxygen and water – resulting in increased shelf-life and food safety. SUCCIPACK, which ended in December 2014, also produced demonstration film wrapping and containers (trays) for packaging cheese, meat, fish and vegetarian food products.

Source: <http://ec.europa.eu>

'Electronic nose' determines food freshness

Researchers at Tomsk State University (TSU), Russia, have developed a new device that analyzes gas mixtures using semiconductor sensors. Odor is determined by a combination of existing gases in the atmosphere. Researchers have found that the conductivity of a semiconductor probe changes during sedimentation of the gas molecules from the atmosphere, which indicates their presence. During manufacture, the sensor can be customized to react differently to various atmospheric gases.

However, it is impossible to make a sensor that reacts to only one gas; the system is needed to achieve sensitivity and selectivity. This allows, via certain processing techniques, accurately identifying the gas mixture in the air, which experiments confirm. One of the experiments attempted to determine the freshness of fruits and vegetables. Fruits and vegetables emit hydrogen sulphide, ammonia and other gases.

"We investigated the apples: A control was refrigerated and the rest were left at room temperature. After 12 hours, the device was able to identify that the unchilled fruit emits gases more intensively than the control fruit. Now, the vegetable warehouse receives products by their organoleptic characteristics, and using the device will more accurately determine the shelf-life of products, which will affect quality," said Timur Muksunov, at TSU. The device is fully developed and is being tested for effectiveness.

Source: <http://www.phys.org>

Tomato-harvesting robots

Squse, Japan, a company that engages in system integration and development of industrial robots has developed an automatic tomato harvesting robot. This robot is being developed by the company with aid from the Japan's Ministry of Economy, Trade and Industry (METI) and Ministry of Agriculture, Forestry and Fisheries (MAFF). The company is testing the robot in Nagasaki Prefecture and Hokkaido.

With a camera and range image sensor attached to each of the main body and the tips of the two robotic arms, the robot recognizes the bunches and fruits of tomatoes. When it detects a targeted fruit, two units of the "UR5" multi-joint robot, which was developed Universal Robots A/S, Denmark, function as arms and collect the fruit. At this point, the time it takes from searching to harvesting is 20 seconds.

The total mass of the exhibited robot was about 400 kg. It is powered by a lead-acid battery. To reduce weight and size, the company plans to employ a sheet-type lithium-ion battery in the future. Squse exhibited a prototype of the robot, and it is currently developing a second prototype. The company plans to reduce the size of the main body and replace the arms with the N-Jiku Robot, which it developed with help from New Energy and Industrial Technology Development Organization (NEDO).

Source: <http://www.japantoday.com>

Concentration system for food industry

Ederna, France, has announced that its evapEOs evaporating system has been selected for trials at Cornell University, the United

States. This new process will likely save energy and improve food quality. An alternative to other energy-hungry and product-degrading evaporation systems, the evapEOs process allows juices, coffee, tea, and other food liquids to be safely and thoroughly concentrated while retaining exceptionally high levels of nutrients (antioxidants, vitamins) and quality (flavor, aroma, original color), while consuming very low amounts of energy. It can also be used upstream of drying processes (such as spray-drying or lyophilization) to significantly reduce energy costs and processing time.

Source: <http://www.foodingredientsfirst.com>

Egg unboiling machine

Scientists at Flinders University, Australia, have built a machine that can "unboil" an egg by untying its proteins. It can also cut through strong carbon nanotubes, which is a process that can revolutionize electronics and drugs. Scientists revealed that the Vortex Fluidic Device (VFD) has the ability to slice carbon nanotubes with great precision, and within just a year, these nanotubes can be commercialized.

In September 2015, the researchers received an Ig Nobel prize for figuring out a way to do something that seems impossible – partially unboiling an egg. When boiled, the egg proteins unfold and refold, until they get entangled. This device can slice CNTs to an average length of 170 nanometers using laser, a solvent and water. With its ability to cut super strong carbon nanotubes, the small machine offers potential uses, perhaps in formulating cancer drugs and solar panels.

Source: <http://www.techtimes.com>

Advances in Food Biotechnology

This book provides an overview of the latest development in food biotechnology as it relates to safety, quality and security. Bringing together experts drawn from around the world, the book is a comprehensive reference in the most progressive field of food science and will be of interest to professionals, scientists and academics in the food and biotech industries. The book will be highly resourceful to governmental research and regulatory agencies and those who are studying and teaching food biotechnology.

Emerging Dairy Processing Technologies: Opportunities for the Dairy Industry

This book brings together all the available information on alternative milk processing techniques and their impact on the physical and functional properties of milk, written by researchers who have developed a body of work in each of the technologies. This book is aimed at dairy scientists and technologists who may be working in dairy companies or academia. It will also be highly relevant to food processing experts working with dairy ingredients, as well as university departments, research centres and graduate students.

For the above two books, contact: John Wiley & Sons Singapore Pte. Ltd., 1 Fusionopolis Walk#07-01 Solaris South Tower, Singapore 138628. Tel: +65-6643-8333; Fax: +65-6643-8397; E-mail: csd_ord@wiley.com

Processing, Dehydration, Canning, Preservation of Fruits & Vegetables

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Contact: NIIR Project Consultancy Services (NPCS), 106-E, Kamla Nagar, New Delhi-110007, India. Tel: +91-11-2384-3955; Fax: +91-11-2384-1561; E-mail: npcs.india@gmail.com

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